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EXAMINER	
UHLIR, NIKOLAS J	
ART UNIT	**PAPER NUMBER**
1773	7

DATE MAILED: 12/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/900,771	MASE ET AL.	
	Examiner	Art Unit	
	Nikolas J. Uhlir	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 16 September 2002 .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-20 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 06 July 2001 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. Figure 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. Applicant admits that figure 2 is prior art page 7, lines 28-29 of the instant specification.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. In the instant case, the applicant in claims 1 and 13 requires a heat controller for an object comprising a base material radiating heat and a phase change substance overlying the base material. It is unclear to the examiner from the claims whether the "base material" claimed can be the surface of an object, i.e the phase-change material can be coated directly on the radiating surface of an object, or if the claimed base material is in fact an intermediate layer present between the object surface and the phase change material. The examiner recognizes that the applicant's specification is directed towards a heat controller that is formed on the surface of an object as a separate layer, with the heat controller comprising a base material layer formed on the object and a phase change layer overtop the base material

layer, as shown by figure 1. However, claims 1 and 13, as written, can be interpreted differently, i.e. "the base material radiating a large amount of heat" could be interpreted to be the heat radiating surface of a hot object, as shown by figure 2, and not a layer in a composite coating formed on an object, as shown by figure 1. Clarification is required.

4. Further, the terms "high-temperature" "low-temperature," "large," "small," and "high reflectivity" in claims 1 and 13, and "several" in claim 2, are relative terms which render these claims indefinite. The terms stated are not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The examiner acknowledges the applicants argument that figure 5 provides the requisite information necessary to allow one of ordinary skill in the art to be apprised of the scope of these claims. However, examiner disagrees, as figure five merely shows a change in emissivity of one example material, $La_{0.8}Sr_{0.075}Ca_{0.125}MnO_2$. No clear definition is provided for "large" and "small" amounts of heat, nor is the scope of "high temperature phase" and "low temperature phase" clearly elucidated from this drawing. The particular problem with the terms "high," "low," "large," and "small," is that it is unclear what they are relative to. The examiner respectfully suggests the applicant adopt relative terminology, i.e "wherein the base material radiates larger amounts of heat at a high temperature relative to that of the same material at low temperature phase" would be acceptable. Correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

6. Claims 1, 4-5, 8, 12-13, 15-16, 18, and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Okamoto et al. (US5296285).

7. For the purpose of this rejection under 102, the examiner has interpreted claims 1 and 13 to allow for the fact that the base material could be the surface of a hot object, as shown by the figure 2 of the instant specification.

8. Regarding the limitations of claim 1, wherein the applicant requires a heat controller for an object comprising a composite material comprising: a base material radiating a large amount of heat at a high-temperature phase; and a phase-change substance overlying the base material, wherein the phase changing material exhibits metallic properties at the low temperature phase, insulating properties at the high temperature phase, high heat radiation at the high temperature phase, low heat radiation at the low temperature phase, and high reflectivity to thermal infrared at a low temperature phase.

9. Okamoto et al. teaches a heat control device suitable for use on an artificial satellite or spacecraft (page 1, section 1). This heat control device comprises a variable phase substance arranged on the heat radiation surfaces of a spacecraft. The variable-phase substance is a manganese perovskite oxide that undergoes a phase transition around room temperature. This substance has the characteristics of a metal at the low temperature phase, and the characteristics of an insulator at the high temperature phase. Further, this substance has a low heat radiation ratio at low temperature, and a

high heat radiation ratio at high temperature (page 1, section 0016). Figure 2 clearly shows that this material exhibits higher infrared reflectivity in the low temperature phase as opposed to the high temperature phase. Thus, the phase change material of Okamoto et al. meets the material property requirements of claim 1. This phase-change material is mounted in the form of a film on the heat radiation surfaces of a spacecraft, and so is lightweight and space saving (page 1-2, sections 19). The examiner takes the position that the heat radiation surface taught by Okamoto et al. meets the limitations in claim 1 requiring a base material radiating a large amount of heat. Further, the examiner takes the position that the satellite body on which the heat radiation surface is formed meets the requirement in claim 1 of an object.

10. Regarding the limitations of claims 4 and 5, wherein the applicant requires the phase change material to be a perovskite oxide (claim 4), specifically a manganese perovskite oxide (claim 5). These limitations are met as set forth above for claim 1.

11. Regarding the limitations of claims 8, wherein the applicant requires a reflective plate or reflective layer having reflectivity to visible light to be laminated on the surface of the phase change material opposite the base material. Okamoto et al. teaches that when this material is mounted on a position that receives sunlight, a silicon plate transparent to thermal infrared but opaque to sunlight may be positioned in front of the variable phase substance in order to minimize sunlight absorption (pages 1-2, section 19). Because the silicon plate is opaque to sunlight, the examiner takes the position that is will be reflective to sunlight to some degree, and thus meets the limitations of claim 8.

12. Regarding the limitations of claim 12, wherein the applicant requires the object to be an electronic circuit used in a space vehicle, including a man-made satellite and a spaceship. This limitation is met as set forth above for claim 1.

13. Regarding the limitations of claims 13, 15-16, 18, and 20, wherein the applicant requires a method for controlling heat in an object. Claims 13, 15-16, 18, and 20 require no significant method steps, as they only require that the layers having the required properties be "provided" or "formed" in the requisite order. Aside from these method limitations, the limitations of claims 13, 15-16, 18 and 20, are identical to claims 1, 4-5, 8 and 12. Thus, because no significant method steps are required by claims 13, 15-16, 18, and 20, these limitations are met as set forth above for claims 1, 4-5, 8 and 12.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. Claims 1, 3-9 and 12- 20 rejected under 35 U.S.C. 103(a) as being unpatentable over Babel et al. (US5296285) in view of Okamoto et al. (US2001/0027856A1).

16. For the purpose of the rejection under 35 USC 103(a), the examiner has interpreted claims 1 and 13 to require that the base material layer is formed on the surface of an object, as illustrated by figure 1 of the instant specification.

17. Regarding the limitations of claim 1, wherein the applicant requires a heat controller for an object comprising a composite material comprising: a base material

radiating a large amount of heat at a high-temperature phase; and a phase-change substance overlying the base material, wherein the phase changing material exhibits metallic properties at the low temperature phase, insulating properties at the high temperature phase, high heat radiation at the high temperature phase, low heat radiation at the low temperature phase, and high reflectivity to thermal infrared at a low temperature phase.

18. For the purposes of this examination, the examiner has interpreted "base material" as required by claims 1 and 13 to mean a layer of material which is not the surface of an object, as is commensurate in scope with the instant specification and as illustrated by figure 1.

19. Babel et al..teaches a high emittance, low absorptance coating for an aluminum substrate comprising a layer of anodized aluminum on the substrate, and a layer of white paint on the anodized aluminum (column 2, line 63-column 3, line 2). This coating is used as a thermal control surface of a spacecraft (column 4, lines 54-59). The examiner takes the position that the Babel et al. coating meets the requirements of the applicants claimed "base radiating a large amount of heat," due to the fact that the coating has high emissivity and is used for a thermal control surface of a spacecraft.

20. Babel et al. does not teach a phase-change substance overlying a base material, wherein the phase changing material exhibits metallic properties at the low temperature phase, insulating properties at the high temperature phase, high heat radiation at the high temperature phase, low heat radiation at the low temperature phase, and high reflectivity to thermal infrared at a low temperature phase.

21. However, Okamoto et al. teaches a heat control device suitable for use on an artificial satellite or spacecraft (page 1, section 1). This heat control device comprises a variable phase substance arranged on the heat radiation surfaces of a spacecraft. The variable-phase substance is a manganese perovskite oxide that undergoes a phase transition around room temperature. This substance has the characteristics of a metal at the low temperature phase, and the characteristics of an insulator at the high temperature phase. Further, this substance has a low heat radiation ratio at low temperature, and a high heat radiation ratio at high temperature (page 1, section 0016). Figure 2 clearly shows that this material exhibits higher infrared reflectivity in the low temperature phase as opposed to the high temperature phase. Thus, the phase change material of Okamoto et al. meets the material property requirements of claim 1. Thus, the material regulates the amount of heat radiated from the surfaces of the spacecraft on order to control the internal temperature of the spacecraft (page 1, section 2 and section 15). This phase-change material is mounted in the form of a film on the heat radiation surfaces of a spacecraft, and so is lightweight and space saving (page 1-2, sections 19). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the phase change substance taught by Okamoto et al. over the high emissivity, low absorptance coating taught by Babel et al.

22. One would have been motivated to make such a modification due to the fact that the Babel et al. coating is designed to be used as a thermal control surface of a spacecraft, and the Okamoto et al. coating is specifically taught to be used on the heat radiation (i.e thermal control) surfaces of a spacecraft. One would have been further

motivated to make such a modification due to the teaching in Okamoto et al. that the phase change substance maintains the internal temperature of the spacecraft to which it is applied within a given range by automatically adjusting its heat radiation and reflectance characteristics based on its temperature.

23. Regarding the limitations of claim 3, wherein he applicant requires the base material to be thicker than the phase change material. Although this requirement is not specifically taught, Okamoto et al. teaches that the phase change substance is formed to a thickness of several hundred microns (page 2, section 22 of Okamoto et al.), and is designed to be "light weight" (page 1 section 19). The examiner interprets "several hundred microns" in Okamoto et al. to mean $\geq 200\mu$. It is well known in the art that the thickness of any solid layer is a results effective variable, with thicker layers weighing more than thinner layers. Thus, it would have been obvious to one with ordinary skill in the art at the time the invention was made to form the Okamoto et al. coating to the minimum acceptable thickness of 200μ in light of the fact that the Okamoto et al. coating is designed to be light weight and the minimum thickness specified is "several hundred microns." Further, Babel et al. teaches that the total thickness of the anodized aluminum and the high emissivity coating affects the corrosion resistance, with corrosion resistance increasing as the total thickness increases from 1-8 mils ($38\text{-}203\mu$) (column 3, lines 10-28 of Babel et al.). Thus, the examiner takes the position that the thickness of the base layer (alumina + high emissivity coating) taught by Babel et al. is a results effective variable. It would have been obvious to one with ordinary skill in the art to form the Babel et al. coating to a thickness of 8 mils (203 microns) in order to achieve

a base coating that has high corrosion resistance. When the base of Babel et al. ios formed to a thickness of 8mils and the coating of Okamoto et al. is formed to a thickness of 200μ, the limitations of claim 3 (base thickness>phase change thickness) are met.

24. Regarding the limitations of claims 4 and 5, wherein the applicant requires the phase change substance to be a perovskite oxide (claim 4), specifically a manganese perovskite (claim 5). These limitations are met as set forth above for claim 1.

25. Regarding the limitations of claim 6, wherein the applicant requires the base material to have a thickness in the range of 10-100μm. Babel et al. teaches that the thickness of the high emissivity, low absorptance coating is between 1.5-8 mils (38-203μm), with thicker coatings exhibiting high corrosion resistance and thin coatings being lightweight (column 3, lines 15-30 and column 4, lines 44-54). Thus the examiner takes the position that the thickness of the high emissivity, low absorptance coating taught by Babel et al. is a results effective variable.

26. Therefore it would have been obvious to one with ordinary skill in the art to optimize the thickness of the high emissivity, low absorptance coating taught by Babel et al. in order to achieve a desired balance between weight and corrosion resistance.

27. Regarding the limitations of claim 7, wherein the applicant requires the base material to be selected from the groups consisting of silicone, alumina, and partially stabilized zirconia. This limitation is met as set forth above for claim 1, as Babel et al. clearly teaches a base coating that comprises anodized aluminum. Anodized aluminum

is known in the art to comprise aluminum oxide (Al_2O_3), which is also known in the art as alumina. Thus, this limitation is met.

28. Regarding the limitations of claim 8, wherein the applicant requires a reflective plate to be laminated on the phase change material on the opposite side from the base material. Okamoto et al. teaches that when the phase change material is mounted on a position that receives sunlight, a silicon plate transparent to thermal infrared but opaque to sunlight may be positioned in front of the variable phase substance in order to minimize sunlight absorption (pages 1-2, section 19). This silicon plate, because it is opaque to visible light and minimizes absorption of sunlight, it will necessarily be reflective to visible radiation thus meeting the reflection requirement in claim 8.

29. Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to use the silicon plate taught by Okamoto et al. above the phase change material utilized by Babel et al. as modified by Okamoto et al.

30. One would have been motivated to make this modification due to the teaching in Okamoto et al. that the silicon plate minimizes the absorption of sunlight by a phase change material that is mounted on the surface of a satellite that is exposed to sunlight.

31. Regarding the limitations of claim 9, wherein the applicant requires the composite material to be affixed to the substrate either directly or with an intervening heat-conductive adhesive. This limitation is met as set forth above for claim 1, as the coating of Babel et al. is clearly affixed directly to the substrate.

32. Regarding the limitations of claim 12, wherein the applicant requires the object to be an electronic circuit used in a space vehicle, including a man-made satellite and a

spaceship. This limitation is met as set forth above for claim 1, as Babel et al. as modified by Okamoto et al. are taught to be used on spacecraft, including man made satellites.

33. Regarding the limitations of claim 13-20 wherein the applicant requires a method for controlling heat. These limitations are met as set forth above for claims 1, 3-9 and 12. The applicant in claims 13-20 requires no substantial method steps other than "providing" or "forming" layers having the same properties on the same types of substrates as required by claims 1, 3-9 and 12. Thus, these limitations are met as set forth above, because the combination of Babel et al. with Okamoto et al. would require the layers to be "provided" in the order recited.

34. Claims 1 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Long et al. (US6176453) in view of Okamoto et al.

35. Regarding the limitations of claim 1, wherein the applicant requires a heat controller for an object comprising a composite material comprising: a base material radiating a large amount of heat at a high-temperature phase; and a phase-change substance overlying the base material, wherein the phase changing material exhibits metallic properties at the low temperature phase, insulating properties at the high temperature phase, high heat radiation at the high temperature phase, low heat radiation at the low temperature phase, and high reflectivity to thermal infrared at a low temperature phase.

36. Long et al. teaches a radiator comprising a structure that generates heat, and a radiator element in thermal communication with the structure. The radiator element is

coated with a white thermal control paint that has high emissivity and low solar absorptance (column 2, lines 1-13). The examiner interprets the white thermal control paint of Long et al. to meet applicant's requirement of a "base material radiating a large amount of heat."

37. Long et al. does not teach a phase-change substance overlying a base material, wherein the phase changing material exhibits metallic properties at the low temperature phase, insulating properties at the high temperature phase, high heat radiation at the high temperature phase, low heat radiation at the low temperature phase, and high reflectivity to thermal infrared at a low temperature phase.

38. However, Okamoto et al. teaches a heat control device suitable for use on an artificial satellite or spacecraft (page 1, section 1). This heat control device comprises a variable phase substance arranged on the heat radiation surfaces of a spacecraft. The variable-phase substance is a manganese perovskite oxide that undergoes a phase transition around room temperature. This substance has the characteristics of a metal at the low temperature phase, and the characteristics of an insulator at the high temperature phase. Further, this substance has a low heat radiation ratio at low temperature, and a high heat radiation ratio at high temperature (page 1, section 0016). Figure 2 clearly shows that this material exhibits higher infrared reflectivity in the low temperature phase as opposed to the high temperature phase. Thus, the phase change material of Okamoto et al. meets the material property requirements of claim 1. Thus, the material regulates the amount of heat radiated from the surfaces of the spacecraft on order to control the internal temperature of the spacecraft (page 1, section 2 and

section 15). This phase-change material is mounted in the form of a film on the heat radiation surfaces of a spacecraft, and so is lightweight and space saving (page 1-2, sections 19).

39. Therefore it would have been obvious to one with ordinary skill in the art to form the phase-change coating of Okamoto et al. over the surface of the heat radiator panel taught by Long et al.

40. One would have been motivated to make such a modification due to the teaching in Okamoto et al. that coating the radiator panel of a satellite with a phase change material of a manganese perovskite oxide allows the internal temperature of a spacecraft to be passively controlled within a desired temperature range.

41. Regarding the limitations of claim 10, wherein the applicant requires the composite material to be joined to the object with an "appropriate intervening adhesive."

42. Long et al. teaches that when the white thermal control paint is applied to the surface of the substrate, the surface of the substrate is primed with a primer to improve the adhesion of the paint (column 8, lines 16-24). "Adhesive" is defined by Webster's Collegiate Dictionary 10th edition 1998 as "tending to adhere or to cause adherence." Thus, because the primer of Long et al. is improving the adhesion of the paint, the examiner takes the position that the primer of Long et al. meets the applicant's requirement of an "appropriate intervening adhesive."

43. Claims 1 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasuda et al. (US466760) in view of Okamoto et al.

44. Regarding the limitations of claim 1, wherein the applicant requires a heat controller for an object comprising a composite material comprising: a base material radiating a large amount of heat at a high-temperature phase; and a phase-change substance overlying the base material, wherein the phase changing material exhibits metallic properties at the low temperature phase, insulating properties at the high temperature phase, high heat radiation at the high temperature phase, low heat radiation at the low temperature phase, and high reflectivity to thermal infrared at a low temperature phase.

45. Hasuda et al. teaches a flexible optical solar reflector comprising a solar light reflecting layer and a heat radiation layer (column 5, lines 55-67). This reflector can be applied to curved surfaces (column 4, lines 16-23) and is intended for use on artificial satellites (column 3, lines 5-25). The examiner interprets the solar reflecting layer of Hasuda et al. to meet the requirements of a "base material radiating a large amount of heat," as required by claim 1.

46. Hasuda et al. does not teach a phase-change substance overlying a base material, wherein the phase changing material exhibits metallic properties at the low temperature phase, insulating properties at the high temperature phase, high heat radiation at the high temperature phase, low heat radiation at the low temperature phase, and high reflectivity to thermal infrared at a low temperature phase.

47. However, Okamoto et al. teaches a heat control device suitable for use on an artificial satellite or spacecraft (page 1, section 1). This heat control device comprises a variable phase substance arranged on the heat radiation surfaces of a spacecraft. The

variable-phase substance is a manganese perovskite oxide that undergoes a phase transition around room temperature. This substance has the characteristics of a metal at the low temperature phase, and the characteristics of an insulator at the high temperature phase. Further, this substance has a low heat radiation ratio at low temperature, and a high heat radiation ratio at high temperature (page 1, section 0016). Figure 2 clearly shows that this material exhibits higher infrared reflectivity in the low temperature phase as opposed to the high temperature phase. Thus, the phase change material of Okamoto et al. meets the material property requirements of claim 1. Thus, the material regulates the amount of heat radiated from the surfaces of the spacecraft on order to control the internal temperature of the spacecraft (page 1, section 2 and section 15). This phase-change material is mounted in the form of a film on the heat radiation surfaces of a spacecraft, and so is lightweight and space saving (page 1-2, sections 19).

48. Therefore it would have been obvious to one of ordinary skill in the art to coat the heat-radiating layer taught by Hasuda et al. with the phase-change material taught by Okamoto et al.

49. One would have been motivated to make such a modification due to the teaching in Okamoto et al. that the amount of heat radiated by a radiator panel of a spacecraft can be controlled within a specific range by coating the surface of the radiator panel with a layer of a phase change material.

Response to Arguments

50. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Examiner's Note

51. The examiner would like to note that claim 2 would be indicated as allowable if the 112 issues present in claims 1 were corrected. Further, if the applicant labels figure 2 as prior art, clears up the 112 issues in claims 1-20, and inserts the limitations of claim 2 into both claims 1 and 13, all of the claims will be allowable over the prior art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikolas J. Uhlir whose telephone number is 703-305-0179. The examiner can normally be reached on Mon-Fri 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on 703-308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-0389.

NJU
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December 2, 2002

Paul Thibodeau
Supervisory Patent Examiner
Technology Center 1700